Figure 1:
ATRX open reading frame (SEQ ID NO:1) and translation to corresponding polypeptide (SEQ ID NO:2)

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1    ATG ACC GCT GAG CCC ATG AGT GAA AGC AAG TTG AAT ACA TTG GTG   45
1     M   T   A   E   P   M   S   E   S   K   L   N   T   L   V   15

46   CAG AAG CTT CAT GAC TTC CTT GCA CAC TCA TCA GAA GAA TCT GAA   90
16    Q   K   L   H   D   F   L   A   H   S   S   E   E   S   E   30

91   GAA ACA AGT TCT CCT CCA CGA CTT GCA ATG AAT CAA AAC ACA GAT   135
31    E   T   S   S   P   P   R   L   A   M   N   Q   N   T   D   45

136  AAA ATC AGT GGT TCT GGA AGT AAC TCT GAT ATG ATG GAA AAC AGC   180
46    K   I   S   G   S   G   S   N   S   D   M   M   E   N   S   60

181  AAG GAA GAG GGA ACT AGC TCT TCA GAA AAA TCC AAG TCT TCA GGA   225
61    K   E   E   G   T   S   S   S   E   K   S   K   S   S   G   75

226  TCG TCA CGA TCA AAG AGG AAA CCT TCA ATT GTA ACA AAG TAT GTA   270
76    S   S   R   S   K   R   K   P   S   I   V   T   K   Y   V   90

271  GAA TCA GAT GAT GAA AAA CCT TTG GAT GAT GAA ACT GTA AAT GAA   315
91    E   S   D   D   E   K   P   L   D   D   E   T   V   N   E   105

316  GAT GCG TCT AAT GAA AAT TCA GAA AAT GAT ATT ACT ATG CAG AGC   360
106   D   A   S   N   E   N   S   E   N   D   I   T   M   Q   S   120

361  TTG CCA AAA GGT ACA GTG ATT GTA CAG CCA GAG CCA GTG CTG AAT   405
121   L   P   K   G   T   V   I   V   Q   P   E   P   V   L   N   135

406  GAA GAC AAA GAT GAT TTT AAA GGG CCT GAA TTT AGA AGC AGA AGT   450
136   E   D   K   D   D   F   K   G   P   E   F   R   S   R   S   150

451  AAA ATG AAA ACT GAA AAT CTC AAA AAA CGC GGA GAA GAT GGG CTT   495
151   K   M   K   T   E   N   L   K   K   R   G   E   D   G   L   165

496  CAT GGG ATT GTG AGC TGC ACT GCT TGT GGA CAA CAG GTC AAT CAT   540
166   H   G   I   V   S   C   T   A   C   G   Q   Q   V   N   H   180

541  TTT CAA AAA GAT TCC ATT TAT AGA CAC CCT TCA TTG CAA GTT CTT   585
181   F   Q   K   D   S   I   Y   R   H   P   S   L   Q   V   L   195

586  ATT TGT AAG AAT TGC TTT AAG TAT TAC ATG AGT GAT GAT ATT AGC   630
196   I   C   K   N   C   F   K   Y   Y   M   S   D   D   I   S   210

631  CGT GAC TCA GAT GGA ATG GAT GAA CAA TGT AGG TGG TGT GCG GAA   675
211   R   D   S   D   G   M   D   E   Q   C   R   W   C   A   E   225

676  GGT GGA AAC TTG ATT TGT TGT GAC TTT TGC CAT AAT GCT TTC TGC   720
226   G   G   N   L   I   C   C   D   F   C   H   N   A   F   C   240

721  AAG AAA TGC ATT CTA CGC AAC CTT GGT CGA AAG GAG TTG TCC ACA   765
241   K   K   C   I   L   R   N   L   G   R   K   E   L   S   T   255

766  ATA ATG GAT GAA AAC AAC CAA TGG TAT TGC TAC ATT TGT CAC CCA   810
256   I   M   D   E   N   N   Q   W   Y   C   Y   I   C   H   P   270

811  GAG CCT TTG TTG GAC TTG GTC ACT GCA TGT AAC AGC GTA TTT GAG   855
271   E   P   L   L   D   L   V   T   A   C   N   S   V   F   E   285

856  AAT TTA GAA CAG TTG TTG CAG CAA AAT AAG AAG AAG ATA AAA GTT   900
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286    N   L   E   Q   L   L   Q   Q   N   K   K   K   I   K   V    300

901   GAC AGT GAA AAG AGT AAT AAA GTA TAT GAA CAT ACA TCC AGA TTT   945
301    D   S   E   K   S   N   K   V   Y   E   H   T   S   R   F    315

946   TCT CCA AAG AAG ACT AGT TCA AAT TGT AAT GGA GAA GAA AAG AAA   990
316    S   P   K   K   T   S   S   N   C   N   G   E   E   K   K    330

991   TTA GAT GAT TCC TGT TCT GGC TCT GTA ACC TAC TCT TAT TCC GCA  1035
331    L   D   D   S   C   S   G   S   V   T   Y   S   Y   S   A    345

1036  CTA ATT GTG CCC AAA GAG ATG ATT AAG AAG GCA AAA AAA CTG ATT  1080
346    L   I   V   P   K   E   M   I   K   K   A   K   K   L   I    360

1081  GAG ACC ACA GCC AAC ATG AAC TCC AGT TAT GTT AAA TTT TTA AAG  1125
361    E   T   T   A   N   M   N   S   S   Y   V   K   F   L   K    375

1126  CAG GCA ACA GAT AAT TCA GAA ATC AGT TCT GCT ACA AAA TTA CGT  1170
376    Q   A   T   D   N   S   E   I   S   S   A   T   K   L   R    390

1171  CAG CTT AAG GCT TTT AAG TCT GTG TTG GCT GAT ATT AAG AAG GCT  1215
391    Q   L   K   A   F   K   S   V   L   A   D   I   K   K   A    405

1216  CAT CTT GCA TTG GAA GAA GAC TTA AAT TCC GAG TTT CGA GCG ATG  1260
406    H   L   A   L   E   E   D   L   N   S   E   F   R   A   M    420

1261  GAT GCT GTA AAC AAA GAG AAA AAT ACC AAA GAG CAT AAA GTC ATA  1305
421    D   A   V   N   K   E   K   N   T   K   E   H   K   V   I    435

1306  GAT GCT AAG TTT GAA ACA AAA GCA CGA AAA GGA GAA AAA CCT TGT  1350
436    D   A   K   F   E   T   K   A   R   K   G   E   K   P   C    450

1351  GCT TTG GAA AAG AAG GAT ATT TCA AAG TCA GAA GCT AAA CTT TCA  1395
451    A   L   E   K   K   D   I   S   K   S   E   A   K   L   S    465

1396  AGA AAA CAG GTA GAT AGT GAG CAC ATG CAT CAG AAT GTT CCA ACA  1440
466    R   K   Q   V   D   S   E   H   M   H   Q   N   V   P   T    480

1441  GAG GAA CAA AGA ACA AAT AAA AGY ACC GGT GGT GAA CAT AAG AAA  1485
481    E   E   Q   R   T   N   K   X   T   G   G   E   H   K   K    495

1486  TCT GAT AGA AAA GAA GAA CCT CAA TAT GAA CCT GCC AAC ACT TCT  1530
496    S   D   R   K   E   E   P   Q   Y   E   P   A   N   T   S    510

1531  GAA GAT TTA GAC ATG GAT ATT GTG TCT GTT CCT TCC TCA GTT CCA  1575
511    E   D   L   D   M   D   I   V   S   V   P   S   S   V   P    525

1576  GAA GAC ATT TTT GAG AAT CTT GAG ACT GCT ATG GAA GTT CAG AGT  1620
526    E   D   I   F   E   N   L   E   T   A   M   E   V   Q   S    540

1621  TCA GTT GAT CAT CAA GGG GAT GGC AGC AGT GGA ACT GAA CAA GAA  1665
541    S   V   D   H   Q   G   D   G   S   S   G   T   E   Q   E    555

1666  GTG GAG AGT TCA TCT GTA AAA TTA AAT ATT TCT TCA AAA GAC AAC  1710
556    V   E   S   S   S   V   K   L   N   I   S   S   K   D   N    570

1711  AGA GGA GGT ATT AAA TCA AAA ACT ACA GCT AAA GTA ACA AAA GAA  1755
571    R   G   G   I   K   S   K   T   T   A   K   V   T   K   E    585

1756  TTA TAT GTT AAA CTC ACT CCT GTT TCC CTT CCT AAT TCC CCA ATT  1800
586    L   Y   V   K   L   T   P   V   S   L   P   N   S   P   I    600

1801  AAA GGT GCT GAT TGT CAG GAA GTT CCA CAA GAT AAA GAT GGC TAT  1845
601    K   G   A   D   C   Q   E   V   P   Q   D   K   D   G   Y    615
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1846  AAA AGT TGT GGT CTG AAC CCC AAG TTA GAG AAA TGT GGA CTT GGA  1890
616     K   S   C   G   L   N   P   K   L   E   K   C   G   L   G  630

1891  CAG GAA AAC AGT GAT AAT GAG CAT TTG GTT GAA AAT GAA GTT TCA  1935
631     Q   E   N   S   D   N   E   H   L   V   E   N   E   V   S  645

1936  TTA CTT TTA GAG GAA TCT GAT CTT CGG AGA TCC CCA CGT GTA AAG  1980
646     L   L   L   E   E   S   D   L   R   R   S   P   R   V   K  660

1981  ACT ACA CCC TTG AGG CGA CCG ACA GAA ACT AAC CCT GTA ACA TCT  2025
661     T   T   P   L   R   R   P   T   E   T   N   P   V   T   S  675

2026  AAT TCA GAT GAA GAA TGT AAT GAA ACA GTT AAG GAG AAA CAA AAA  2070
676     N   S   D   E   E   C   N   E   T   V   K   E   K   Q   K  690

2071  CTA TCA GTT CCA GTG AGA AAA AAG GAT AAG CGT AAT TCT TCT GAC  2115
691     L   S   V   P   V   R   K   K   D   K   R   N   S   S   D  705

2116  AGT GCT ATA GAT AAT CCT AAG CCT AAT AAA TTG CCA AAA TCT AAG  2160
706     S   A   I   D   N   P   K   P   N   K   L   P   K   S   K  720

2161  CAA TCA GAG ACT GTG GAT CAA AAT TCA GAT TCT GAT GAA ATG CTA  2205
721     Q   S   E   T   V   D   Q   N   S   D   S   D   E   M   L  735

2206  GCA ATC CTC AAA GGG GTG AGC AGG ATG AGT CAC AGT TCT TCT TCA  2250
736     A   I   L   K   G   V   S   R   M   S   H   S   S   S   S  750

2251  GAT ACT GAT ATT AAT GAA ATT CAT ACA AAC CAT AAG ACT TTG TAT  2295
751     D   T   D   I   N   E   I   H   T   N   H   K   T   L   Y  765

2296  GAT TTA AAG ACT CAG GCG GGG AAA GAT GAT AAA GGA AAA AGG AAA  2340
766     D   L   K   T   Q   A   G   K   D   D   K   G   K   R   K  780

2341  CGA AAA AGT TCT ACA TCT GGC TCA GAT TTT GAT ACT AAA AAG GGC  2385
781     R   K   S   S   T   S   G   S   D   F   D   T   K   K   G  795

2386  AAA TCA GCT AAG AGC TCT ATA ATT TCT AAA AAG AAA CGA CAA ACC  2430
796     K   S   A   K   S   S   I   I   S   K   K   K   R   Q   T  810

2431  CAG TCT GAG TCT TCT AAT TAT GAC TCA GAA TTA GAA AAA GAG ATA  2475
811     Q   S   E   S   S   N   Y   D   S   E   L   E   K   E   I  825

2476  AAG AGC ATG AGT AAA ATT GGT GCT GCC AGA ACC ACC AAA AAA AGA  2520
826     K   S   M   S   K   I   G   A   A   R   T   T   K   K   R  840

2521  ATT CCA AAT ACA AAA GAT TTT GAC TCT TCT GAA GAT GAG AAA CAC  2565
841     I   P   N   T   K   D   F   D   S   S   E   D   E   K   H  855

2566  AGC AAA AAA GGA ATG GAT AAT CAA GGG CAC AAA AAT TTG AAG ACC  2610
856     S   K   K   G   M   D   N   Q   G   H   K   N   L   K   T  870

2611  TCA CAA GAA GGA TCA TCT GAT GAT GCT GAA AGA AAA CAA GAG AGA  2655
871     S   Q   E   G   S   S   D   D   A   E   R   K   Q   E   R  885

2656  GAG ACT TTC TCT TCA GCA GAA GGC ACA GTT GAT AAA GAC ACG ACC  2700
886     E   T   F   S   S   A   E   G   T   V   D   K   D   T   T  900

2701  ATC ATG GAA TTA AGA GAT CGA CTT CCT AAG AAG CAG CAA GCA AGT  2745
901     I   M   E   L   R   D   R   L   P   K   K   Q   Q   A   S  915

2746  GCT TCC ACT GAT GGT GTC GAT AAG CTT TCT GGG AAA GAG CAG AGT  2790
916     A   S   T   D   G   V   D   K   L   S   G   K   E   Q   S  930

2791  TTT ACT TCT TTG GAA GTT AGA AAA GTT GCT GAA ACT AAA GAA AAG  2835
931     F   T   S   L   E   V   R   K   V   A   E   T   K   E   K  945
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2836  AGC AAG CAT CTC AAA ACC AAA ACA TGT AAA AAA GTA CAG GAT GGC  2880
946    S   K   H   L   K   T   K   T   C   K   K   V   Q   D   G   960

2881  TTA TCT GAT ATT GCA GAG AAA TTC CTA AAG AAA GAC CAG AGC GAT  2925
961    L   S   D   I   A   E   K   F   L   K   K   D   Q   S   D   975

2926  GAA ACT TCT GAA GAT GAT AAA AAG CAG AGC AAA AAG GGA ACT GAA  2970
976    E   T   S   E   D   D   K   K   Q   S   K   K   G   T   E   990

2971  GAA AAA AAG AAA CCT TCA GAC TTT AAG AAA AAA GTA ATT AAA ATG  3015
991    E   K   K   K   P   S   D   F   K   K   K   V   I   K   M  1005

3016  GAA CAA CAG TAT GAA TCT TCA TCT GAT GGC ACT GAA AAG TTA CCT  3060
1006   E   Q   Q   Y   E   S   S   S   D   G   T   E   K   L   P  1020

3061  GAG CGA GAA GAA ATT TGT CAT TTT CCT AAG GGC ATA AAA CAA ATT  3105
1021   E   R   E   E   I   C   H   F   P   K   G   I   K   Q   I  1035

3106  AAG AAT GGA ACA ACT GAT GGA GAA AAG AAA AGT AAA AAA ATA AGA  3150
1036   K   N   G   T   T   D   G   E   K   K   S   K   K   I   R  1050

3151  GAT AAA ACT TCT AAA AAG AAG GAT GAA TTA TCT GAT TAT GCT GAG  3195
1051   D   K   T   S   K   K   K   D   E   L   S   D   Y   A   E  1065

3196  AAG TCA ACA GGG AAA GGA GAT AGT TGT GAC TCT TCA GAG GAT AAA  3240
1066   K   S   T   G   K   G   D   S   C   D   S   S   E   D   K  1080

3241  AAG AGT AAG AAT GGA GCA TAT GGT AGA GAG AAG AAA AGG TGC AAG  3285
1081   K   S   K   N   G   A   Y   G   R   E   K   K   R   C   K  1095

3286  TTG CTT GGA AAG AGT TCA AGG AAG AGA CAA GAT TGC TCA TCA TCT  3330
1096   L   L   G   K   S   S   R   K   R   Q   D   C   S   S   S  1110

3331  GAT ACT GAG AAA TAT TCC ATG AAA GAA GAT GGT TGT AAC TCT TCT  3375
1111   D   T   E   K   Y   S   M   K   E   D   G   C   N   S   S  1125

3376  GAT AAG AGA CTG AAA AGA ATA GAA TTG AGG GAA AGA AGA AAT TTA  3420
1126   D   K   R   L   K   R   I   E   L   R   E   R   R   N   L  1140

3421  AGT TCA AAG AGA AAT ACT AAG GAA ATA CAA AGT GGC TCA TCA TCA  3465
1141   S   S   K   R   N   T   K   E   I   Q   S   G   S   S   S  1155

3466  TCT GAT GCT GAG GAA AGT TCT GAA GAT AAT AAA AAG AAG AAG CAA  3510
1156   S   D   A   E   E   S   S   E   D   N   K   K   K   K   Q  1170

3511  AGA ACT TCA TCT AAA AAG AAG GCA GTC ATT GTC AAG GAG AAA AAG  3555
1171   R   T   S   S   K   K   K   A   V   I   V   K   E   K   K  1185

3556  AGA AAC TCC CTA AGA ACA AGC ACT AAA AGG AAG CAA GCT GAC ATT  3600
1186   R   N   S   L   R   T   S   T   K   R   K   Q   A   D   I  1200

3601  ACA TCC TCA TCT TCT TCT GAT ATA GAA GAT GAT GAT CAG AAT TCT  3645
1201   T   S   S   S   S   S   D   I   E   D   D   D   Q   N   S  1215

3646  ATA GGT GAG GGA AGC AGC GAT GAA CAG AAA ATT AAG CCT GTC ACT  3690
1216   I   G   E   G   S   S   D   E   Q   K   I   K   P   V   T  1230

3691  GAA AAT TTA GTG CTG TCT TCA CAT ACT GGA TTT TGC CAA TCT TCA  3735
1231   E   N   L   V   L   S   S   H   T   G   F   C   Q   S   S  1245

3736  GGA GAT GAA GCC TTA TCT AAA TCA GTG CCT GTC ACA GTG GAT GAT  3780
1246   G   D   E   A   L   S   K   S   V   P   V   T   V   D   D  1260

3781  GAT GAT GAC GAC AAT GAT CCT GAG AAT AGA ATT GCC AAG AAG ATG  3825
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1261   D   D   D   D   N   D   P   E   N   R   I   A   K   K   M   1275

3826 CTT TTA GAA GAA ATT AAA GCC AAT CTT TCC TCT GAT GAG GAT GGA   3870
1276   L   L   E   E   I   K   A   N   L   S   S   D   E   D   G   1290

3871 TCT TCA GAT GAT GAG CCA GAA GAA GGG AAA AAA AGA ACT GGA AAA   3915
1291   S   S   D   D   E   P   E   E   G   K   K   R   T   G   K   1305

3916 CAA AAT GAA GAA AAC CCA GGA GAT GAG GAA GCA AAA AAT CAA GTC   3960
1306   Q   N   E   E   N   P   G   D   E   E   A   K   N   Q   V   1320

3961 AAT TCT GAA TCA GAT TCA GAT TCT GAA GAA TCT AAG AAG CCA AGA   4005
1321   N   S   E   S   D   S   D   S   E   E   S   K   K   P   R   1335

4006 TAC AGA CAT AGG CTT TTG CGG CAC AAA TTG ACT GTG AGT GAC GGA   4050
1336   Y   R   H   R   L   L   R   H   K   L   T   V   S   D   G   1350

4051 GAA TCT GGA GAA GAA AAA AAG ACA AAG CCT AAA GAG CAT AAA GAA   4095
1351   E   S   G   E   E   K   K   T   K   P   K   E   H   K   E   1365

4096 GTC AAA GGC AGA AAC AGA AGA AAG GTG AGC AGT GAA GAT TCA GAA   4140
1366   V   K   G   R   N   R   R   K   V   S   S   E   D   S   E   1380

4141 GAT TCT GAT TTT CAG GAA TCA GGA GTT AGT GAA GAA GTT AGT GAA   4185
1381   D   S   D   F   Q   E   S   G   V   S   E   E   V   S   E   1395

4186 TCC GAA GAT GAA CAG CGG CCC AGA ACA AGG TCT GCA AAG AAA GCA   4230
1396   S   E   D   E   Q   R   P   R   T   R   S   A   K   K   A   1410

4231 GAG TTG GAA GAA AAT CAG CGG AGC TAT AAA CAG AAA AAG AAA AGG   4275
1411   E   L   E   E   N   Q   R   S   Y   K   Q   K   K   K   R   1425

4276 CGA CGT ATT AAG GTT CAA GAA GAT TCA TCC AGT GAA AAC AAG AGT   4320
1426   R   R   I   K   V   Q   E   D   S   S   S   E   N   K   S   1440

4321 AAT TCT GAG GAA GAA GAG GAG GAA AAA GAA GAG GAG GAG GAA GAG   4365
1441   N   S   E   E   E   E   E   E   K   E   E   E   E   E   E   1455

4366 GAG GAG GAG GAG GAA GAG GAG GAG GAA GAT GAA AAT GAT GAT TCC   4410
1456   E   E   E   E   E   E   E   E   E   D   E   N   D   D   S   1470

4411 AAG TCT CCT GGA AAA GGC AGA AAG AAA ATT CGG AAG ATT CTT AAA   4455
1471   K   S   P   G   K   G   R   K   K   I   R   K   I   L   K   1485

4456 GAT GAT AAA CTG AGA ACA GAA ACA CAA AAT GCT CTT AAG GAA GAG   4500
1486   D   D   K   L   R   T   E   T   Q   N   A   L   K   E   E   1500

4501 GAA GAG AGA CGA AAA CGT ATT GCT GAG AGG GAG CGT GAG CGA GAA   4545
1501   E   E   R   R   K   R   I   A   E   R   E   R   E   R   E   1515

4546 AAA TTG AGA GAG GTG ATA GAA ATT GAA GAT GCT TCA CCC ACC AAG   4590
1516   K   L   R   E   V   I   E   I   E   D   A   S   P   T   K   1530

4591 TGT CCA ATA ACA ACC AAG TTG GTT TTA GAT GAA GAT GAA GAA ACC   4635
1531   C   P   I   T   T   K   L   V   L   D   E   D   E   E   T   1545

4636 AAA GAA CCT TTA GTG CAG GTT CAT AGA AAT ATG GTT ATC AAA TTG   4680
1546   K   E   P   L   V   Q   V   H   R   N   M   V   I   K   L   1560

4681 AAA CCC CAT CAA GTA GAT GGT GTT CAG TTT ATG TGG GAT TGC TGC   4725
1561   K   P   H   Q   V   D   G   V   Q   F   M   W   D   C   C   1575

4726 TGT GAG TCT GTG AAA AAA ACA AAG AAA TCT CCA GGT TCA GGA TGC   4770
1576   C   E   S   V   K   K   T   K   K   S   P   G   S   G   C   1590
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4771  ATT CTT GCC CAC TGT ATG GGC CTT GGT AAG ACT TTA CAG GTG GTA   4815
1591    I   L   A   H   C   M   G   L   G   K   T   L   Q   V   V   1605

4816  AGT TTT CTT CAT ACA GTT CTT TTG TGT GAC AAA CTG GAT TTC AGC   4860
1606    S   F   L   H   T   V   L   L   C   D   K   L   D   F   S   1620

4861  ACG GCG TTA GTG GTT TGT CCT CTT AAT ACT GCT TTG AAT TGG ATG   4905
1621    T   A   L   V   V   C   P   L   N   T   A   L   N   W   M   1635

4906  AAT GAA TTT GAG AAG TGG CAA GAG GGA TTA AAA GAT GAT GAG AAG   4950
1636    N   E   F   E   K   W   Q   E   G   L   K   D   D   E   K   1650

4951  CTT GAG GTT TCT GAA TTA GCA ACT GTG AAA CGT CCT CAG GAG AGA   4995
1651    L   E   V   S   E   L   A   T   V   K   R   P   Q   E   R   1665

4996  AGC TAC ATG CTG CAG AGG TGG CAA GAA GAT GGT GGT GTT ATG ATC   5040
1666    S   Y   M   L   Q   R   W   Q   E   D   G   G   V   M   I   1680

5041  ATA GGC TAT GAG ATG TAT AGA AAT CTT GCT CAA GGA AGG AAT GTG   5085
1681    I   G   Y   E   M   Y   R   N   L   A   Q   G   R   N   V   1695

5086  AAG AGT CGG AAA CTT AAA GAA ATA TTT AAC AAA GCT TTG GTT GAT   5130
1696    K   S   R   K   L   K   E   I   F   N   K   A   L   V   D   1710

5131  CCA GGC CCT GAT TTT GTT GTT TGT GAT GAA GGC CAT ATT CTA AAA   5175
1711    P   G   P   D   F   V   V   C   D   E   G   H   I   L   K   1725

5176  AAT GAA GCA TCT GCT GTT TCT AAA GCT ATG AAT TCT ATA CGA TCA   5220
1726    N   E   A   S   A   V   S   K   A   M   N   S   I   R   S   1740

5221  AGG AGG AGG ATT ATT TTA ACA GGA ACA CCA CTT CAA AAT AAC CTA   5265
1741    R   R   R   I   I   L   T   G   T   P   L   Q   N   N   L   1755

5266  ATT GAG TAT CAT TGT ATG GTT AAT TTT ATC AAG GAA AAT TTA CTT   5310
1756    I   E   Y   H   C   M   V   N   F   I   K   E   N   L   L   1770

5311  GGA TCC ATT AAG GAG TTC AGG AAT AGA TTT ATA AAT CCA ATT CAA   5355
1771    G   S   I   K   E   F   R   N   R   F   I   N   P   I   Q   1785

5356  AAT GGT CAG TGT GCA GAT TCT ACC ATG GTA GAT GTC AGA GTG ATG   5400
1786    N   G   Q   C   A   D   S   T   M   V   D   V   R   V   M   1800

5401  AAA AAA CGT GCT CAC ATT CTC TAT GAG ATG TTA GCT GGA TGT GTT   5445
1801    K   K   R   A   H   I   L   Y   E   M   L   A   G   C   V   1815

5446  CAG AGG AAA GAT TAT ACA GCA TTA ACA AAA TTC TTG CCT CCA AAA   5490
1816    Q   R   K   D   Y   T   A   L   T   K   F   L   P   P   K   1830

5491  CAC GAA TAT GTG TTA GCT GTG AGA ATG ACT TCT ATT CAG TGC AAG   5535
1831    H   E   Y   V   L   A   V   R   M   T   S   I   Q   C   K   1845

5536  CTC TAT CAG TAC TAC TTA GAT CAC TTA ACA GGT GTG GGC AAT AAT   5580
1846    L   Y   Q   Y   Y   L   D   H   L   T   G   V   G   N   N   1860

5581  AGT GAA GGT GGA AGA GGA AAG GCA GGT GCA AAG CTT TTC CAA GAT   5625
1861    S   E   G   G   R   G   K   A   G   A   K   L   F   Q   D   1875

5626  TTT CAG ATG TTA AGT AGA ATA TGG ACT CAT CCT TGG TGT TTG CAG   5670
1876    F   Q   M   L   S   R   I   W   T   H   P   W   C   L   Q   1890

5671  CTA GAC TAC ATT AGC AAA GAA AAT AAG GGT TAT TTT GAT GAA GAC   5715
1891    L   D   Y   I   S   K   E   N   K   G   Y   F   D   E   D   1905

5716  AGT ATG GAT GAA TTT ATA GCC TCA GAT TCT GAT GAA ACC TCC ATG   5760
1906    S   M   D   E   F   I   A   S   D   S   D   E   T   S   M   1920
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5761  AGT TTA AGC TCC GAT GAT TAT ACA AAA AAG AAG AAA AAA GGG AAA  5805
1921   S   L   S   S   D   D   Y   T   K   K   K   K   K   G   K  1935

5806  AAG GGG AAA AAA GAT AGT AGC TCA AGT GGA AGT GGC AGT GAC AAT  5850
1936   K   G   K   K   D   S   S   S   S   G   S   G   S   D   N  1950

5851  GAT GTT GAA GTG ATT AAG GTC TGG AAT TCA AGA TCT CGG GGA GGT  5895
1951   D   V   E   V   I   K   V   W   N   S   R   S   R   G   G  1965

5896  GGT GAA GGA AAT GTG GAT GAA ACA GGA AAC AAT CCT TCT GTT TCT  5940
1966   G   E   G   N   V   D   E   T   G   N   N   P   S   V   S  1980

5941  TTA AAA CTG GAA GAA AGT AAA GCT ACT TCT TCT TCT AAT CCA AGC  5985
1981   L   K   L   E   E   S   K   A   T   S   S   S   N   P   S  1995

5986  AGC CCA GCT CCA GAC TGG TAC AAA GAT TTT GTT ACA GAT GCT GAT  6030
1996   S   P   A   P   D   W   Y   K   D   F   V   T   D   A   D  2010

6031  GCT GAG GTT TTA GAG CAT TCT GGG AAA ATG GTA CTT CTC TTT GAA  6075
2011   A   E   V   L   E   H   S   G   K   M   V   L   L   F   E  2025

6076  ATT CTT CGA ATG GCA GAG GAA ATT GGG GAT AAA GTC CTT GTT TTC  6120
2026   I   L   R   M   A   E   E   I   G   D   K   V   L   V   F  2040

6121  AGC CAG TCC CTC ATA TCT CTG GAC TTG ATT GAA GAT TTT CTT GAA  6165
2041   S   Q   S   L   I   S   L   D   L   I   E   D   F   L   E  2055

6166  TTA GCT AGT AGG GAG AAG ACA GAA GAT AAA GAT AAA CCC CTT ATT  6210
2056   L   A   S   R   E   K   T   E   D   K   D   K   P   L   I  2070

6211  TAT AAA GGT GAG GGG AAG TGG CTT CGA AAC ATT GAC TAT TAC CGT  6255
2071   Y   K   G   E   G   K   W   L   R   N   I   D   Y   Y   R  2085

6256  TTA GAT GGT TCC ACT ACT GCA CAG TCA AGG AAG AAG TGG GCT GAA  6300
2086   L   D   G   S   T   T   A   Q   S   R   K   K   W   A   E  2100

6301  GAA TTT AAT GAT GAA ACT AAT GTG AGA GGA CGA TTA TTT ATC ATT  6345
2101   E   F   N   D   E   T   N   V   R   G   R   L   F   I   I  2115

6346  TCT ACT AAA GCA GGA TCT CTA GGA ATT AAT CTG GTA GCT GCT AAT  6390
2116   S   T   K   A   G   S   L   G   I   N   L   V   A   A   N  2130

6391  CGA GTA ATT ATA TTC GAC GCT TCT TGG AAT CCA TCT TAT GAC ATC  6435
2131   R   V   I   I   F   D   A   S   W   N   P   S   Y   D   I  2145

6436  CAG AGT ATA TTC AGA GTT TAT CGC TTT GGA CAA ACT AAG CCT GTT  6480
2146   Q   S   I   F   R   V   Y   R   F   G   Q   T   K   P   V  2160

6481  TAT GTA TAT AGG TTC TTA GCT CAG GGA ACC ATG GAA GAT AAG ATT  6525
2161   Y   V   Y   R   F   L   A   Q   G   T   M   E   D   K   I  2175

6526  TAT GAT CGG CAA GTA ACT AAG CAG TCA CTG TCT TTT CGA GTT GTT  6570
2176   Y   D   R   Q   V   T   K   Q   S   L   S   F   R   V   V  2190

6571  GAT CAG CAG CAG GTG GAG CGT CAT TTT ACT ATG AAT GAG CTT ACT  6615
2191   D   Q   Q   Q   V   E   R   H   F   T   M   N   E   L   T  2205

6616  GAA CTT TAT ACT TTT GAG CCA GAC TTA TTA GAT GAC CCT AAT TCA  6660
2206   E   L   Y   T   F   E   P   D   L   L   D   D   P   N   S  2220

6661  GAA AAG AAG AAG AAG AGG GAT ACT CCC ATG CTG CCA AAG GAT ACC  6705
2221   E   K   K   K   K   R   D   T   P   M   L   P   K   D   T  2235

6706  ATA CTT GCA GAG CTC CTT CAG ATA CAT AAA GAA CAC ATT GTA GGA  6750
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2236   I   L   A   E   L   L   Q   I   H   K   E   H   I   V   G    2250

6751  TAC CAT GAA CAT GAT TCT CTT TTG GAC CAC AAA GAA GAA GAA GAG    6795
2251   Y   H   E   H   D   S   L   L   D   H   K   E   E   E   E    2265

6796  TTG ACT GAA GAA GAA AGA AAA GCA GCT TGG GCT GAG TAT GAA GCA    6840
2266   L   T   E   E   E   R   K   A   A   W   A   E   Y   E   A    2280

6841  GAG AAG AAG GTA CTG ACC ATG CGT TTC AAC ATA CCA ACT GGG ACC    6885
2281   E   K   K   V   L   T   M   R   F   N   I   P   T   G   T    2295

6886  AAT TTA CCC CCT GTC AGT TTC AAC TCT CAA ACT CCT TAT ATT CCT    6930
2296   N   L   P   P   V   S   F   N   S   Q   T   P   Y   I   P    2310

6931  TTC AAT TTG GGA GCC CTG TCA GCA ATG AGT AAT CAA CAG CTG GAG    6975
2311   F   N   L   G   A   L   S   A   M   S   N   Q   Q   L   E    2325

6976  GAC CTC ATT AAT CAA GGA AGA GAA AAA GTT GTA GAA GCA ACA AAC    7020
2326   D   L   I   N   Q   G   R   E   K   V   V   E   A   T   N    2340

7021  AGT GTG ACA GCA GTG AGG ATT CAA CCT CTT GAG GAT ATA ATT TCA    7065
2341   S   V   T   A   V   R   I   Q   P   L   E   D   I   I   S    2355

7066  GCT GTA TGG AAG GAG AAC ATG AAT CTC TCA GAG GCC CAA GTA CAG    7110
2356   A   V   W   K   E   N   M   N   L   S   E   A   Q   V   Q    2370

7111  GCG TTA GCA TTA AGT AGA CAA GCC AGC CAG GAG CTT GAT GTT AAA    7155
2371   A   L   A   L   S   R   Q   A   S   Q   E   L   D   V   K    2385

7156  CGA AGA GAA GCA ATC TAC AAT GAT GTA TTG ACA AAA CAA CAG ATG    7200
2386   R   R   E   A   I   Y   N   D   V   L   T   K   Q   Q   M    2400

7201  TTA ATC AGC TGT GTT CAG CGA ATA CTT ATG AAC AGA AGG CTC CAG    7245
2401   L   I   S   C   V   Q   R   I   L   M   N   R   R   L   Q    2415

7246  CAG CAG TAC AAT CAG CAG CAA CAG CAA CAA ATG ACT TAT CAA CAA    7290
2416   Q   Q   Y   N   Q   Q   Q   Q   Q   Q   M   T   Y   Q   Q    2430

7291  GCA ACA CTG GGT CAC CTC ATG ATG CCA AAG CCC CCA AAT TTG ATC    7335
2431   A   T   L   G   H   L   M   M   P   K   P   P   N   L   I    2445

7336  ATG AAT CCT TCT AAC TAC CAG CAG ATT GAT ATG AGA GGA ATG TAT    7380
2446   M   N   P   S   N   Y   Q   Q   I   D   M   R   G   M   Y    2460

7381  CAG CCA GTG GCT GGT GGT ATG CAG CCA CCA CCA TTA CAG CGT GCA    7425
2461   Q   P   V   A   G   G   M   Q   P   P   P   L   Q   R   A    2475

7426  CCA CCC CCA ATG AGA AGC AAA AAT CCA GGA CCT TCC CAA GGG AAA    7470
2476   P   P   P   M   R   S   K   N   P   G   P   S   Q   G   K    2490

7471  TCA ATG TGA   7479
2491   S   M   *
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Figure 2:
ATRX Antisense fragments

Fragment No. 1: HAP_66D4 (SEQ ID NO:3)
5′TGCACCTGCCTTTCCTCTTCCACCTTCACTATTATTGCCCACACCTGTTAAGTGATCTAAGT
AGTACTGATAGAGCTTGCACTGAATAGAAGTCATTCTCACAGCTAACACATATTCGTGTTTTGG
AGGCAAGAATTTTGTTAATGCTGTATAATCTTTCCTCTGAACACATCCAGCTAACATCTCATAG
AGAATGTGAGCACGTTTTTTCATCACTCTGACATCTACCATGGTAGAATCTGCACACTGACCAT
TTTGAATTGGATTTATAAATCTATTCCTGAACTCCTTAAT 3′

Fragment No. 2: TXA_1B3 (SEQ ID NO:4)
5′GCTTTAGTGCAAATACATTGATTTCCCTTGGGAAGGTCCTGGATTTTTGCTTCTCATTGGGG
GTGGTGCACGCTGTAATGGTGGTGGCTGCATACCACCAGCCACTGGCTGATACATTCCTCTCAT
ATCAATCTGCTGGTAGTTAGAAGGATTCATGATCAAATTTGGGGGCTTTGGCATCATGAGGTGA
CCCAGTGTTGCTTGTTGATAAGTCATTTGTTGCTGTTGCTGCTGATTGTACTGCTGCTGGAGCC
TTCTGTTCATAAGTATTCGCTGAACACAGCTGATTAACATCT 3′

Figure 3:
Alignment between the ATRX open reading frame and the corresponding sense polynucleotide of the ATRX Antisense Fragments

a) AS Fragment No. 1 (HAP-66D4)

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ATRX ORF  1     ATGACCGCTGAGCCCATGAGTGAAAGCAAGTTGAATACATTGGTGCAGAAGCTTCATGACTTCCTTGCACACTCATCAGA
HAP-66D4  1     ----------------------------------------------------------------------------------

ATRX ORF  81    AGAATCTGAAGAAACAAGTTCTCCTCCACGACTTGCAATGAATCAAAACACAGATAAAATCAGTGGTTCTGGAAGTAACT
HAP-66D4  1     ----------------------------------------------------------------------------------

ATRX ORF  161   CTGATATGATGGAAAACAGCAAGGAAGAGGGAACTAGCTCTTCAGAAAAATCCAAGTCTTCAGGATCGTCACGATCAAAG
HAP-66D4  1     ----------------------------------------------------------------------------------

ATRX ORF  241   AGGAAACCTTCAATTGTAACAAAGTATGTAGAATCAGATGATGAAAAACCTTTGGATGATGAAACTGTAAATGAAGATGC
HAP-66D4  1     ----------------------------------------------------------------------------------

ATRX ORF  321   GTCTAATGAAAATTCAGAAAATGATATTACTATGCAGAGCTTGCCAAAAGGTACAGTGATTGTACAGCCAGAGCCAGTGC
HAP-66D4  1     ----------------------------------------------------------------------------------

ATRX ORF  401   TGAATGAAGACAAAGATGATTTTAAAGGGCCTGAATTTAGAAGCAGAAGTAAAATGAAAACTGAAAATCTCAAAAAACGC
HAP-66D4  1     ----------------------------------------------------------------------------------

ATRX ORF  481   GGAGAAGATGGGCTTCATGGGATTGTGAGCTGCACTGCTTGTGGACAACAGGTCAATCATTTTCAAAAAGATTCCATTTA
HAP-66D4  1     ----------------------------------------------------------------------------------

ATRX ORF  561   TAGACACCCTTCATTGCAAGTTCTTATTTGTAAGAATTGCTTTAAGTATTACATGAGTGATGATATTAGCCGTGACTCAG
HAP-66D4  1     ----------------------------------------------------------------------------------

ATRX ORF  641   ATGGAATGGATGAACAATGTAGGTGGTGTGCGGAAGGTGGAAACTTGATTTGTTGTGACTTTTGCCATAATGCTTTCTGC
HAP-66D4  1     ----------------------------------------------------------------------------------

ATRX ORF  721   AAGAAATGCATTCTACGCAACCTTGGTCGAAAGGAGTTGTCCACAATAATGGATGAAAACAACCAATGGTATTGCTACAT
HAP-66D4  1     ----------------------------------------------------------------------------------

ATRX ORF  801   TTGTCACCCAGAGCCTTTGTTGGACTTGGTCACTGCATGTAACAGCGTATTTGAGAATTTAGAACAGTTGTTGCAGCAAA
HAP-66D4  1     ----------------------------------------------------------------------------------

ATRX ORF  881   ATAAGAAGAAGATAAAAGTTGACAGTGAAAAGAGTAATAAAGTATATGAACATACATCCAGATTTTCTCCAAAGAAGACT
HAP-66D4  1     ----------------------------------------------------------------------------------

ATRX ORF  961   AGTTCAAATTGTAATGGAGAAGAAAAGAAATTAGATGATTCCTGTTCTGGCTCTGTAACCTACTCTTATTCCGCACTAAT
HAP-66D4  1     ----------------------------------------------------------------------------------

ATRX ORF  1041  TGTGCCCAAAGAGATGATTAAGAAGGCAAAAAAAACTGATTGAGACCACAGCCAACATGAACTCCAGTTATGTTAAATTTT
HAP-66D4  1     ----------------------------------------------------------------------------------

ATRX ORF  1121  TAAAGCAGGCAACAGATAATTCAGAAATCAGTTCTGCTACAAAATTACGTCAGCTTAAGGCTTTTAAGTCTGTGTTGGCT
HAP-66D4  1     ----------------------------------------------------------------------------------

ATRX ORF  1201  GATATTAAGAAGGCTCATCTTGCATTGGAAGAAGACTTAAATTCCGAGTTTCGAGCGATGGATGCTGTAAACAAAGAGAA
HAP-66D4  1     ----------------------------------------------------------------------------------

ATRX ORF  1281  AAATACCAAAGAGCATAAAGTCATAGATGCTAAGTTTGAAACAAAAGCACGAAAAGGAGAAAAACCTTGTGCTTTGGAAA
HAP-66D4  1     ----------------------------------------------------------------------------------

ATRX ORF  1361  AGAAGGATATTTCAAAGTCAGAAGCTAAACTTTCAAGAAAACAGGTAGATAGTGAGCACATGCATCAGAATGTTCCAACA
HAP-66D4  1     ----------------------------------------------------------------------------------

ATRX ORF  1441  GAGGAACAAAGAACAAATAAAAGYACCGGTGGTGAACATAAGAAATCTGATAGAAAAGAAGAACCTCAATATGAACCTGC
HAP-66D4  1     ----------------------------------------------------------------------------------

ATRX ORF  1521  CAACACTTCTGAAGATTTAGACATGGATATTGTGTCTGTTCCTTCCTCAGTTCCAGAAGACATTTTTGAGAATCTTGAGA
HAP-66D4  1     ----------------------------------------------------------------------------------

ATRX ORF  1601  CTGCTATGGAAGTTCAGAGTTCAGTTGATCATCAAGGGGATGGCAGCAGTGGAACTGAACAAGAAGTGGAGAGTTCATCT
HAP-66D4  1     ----------------------------------------------------------------------------------

ATRX ORF  1681  GTAAAATTAAATATTTCTTCAAAAGACAACAGAGGAGGTATTAAATCAAAAACTACAGCTAAAGTAACAAAAGAATTATA
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HAP-66D4  1     ----------------------------------------------------------------------------------------
ATRX ORF  1761  TGTTAAACTCACTCCTGTTTCCCTTCCTAATTCCCCAATTAAAGGTGCTGATTGTCAGGAAGTTCCACAAGATAAAGATG
HAP-66D4  1     ----------------------------------------------------------------------------------------
ATRX ORF  1841  GCTATAAAAGTTGTGGTCTGAACCCCAAGTTAGAGAAATGTGGACTTGGACAGGAAAACAGTGATAATGAGCATTTGGTT
HAP-66D4  1     ----------------------------------------------------------------------------------------
ATRX ORF  1921  GAAAATGAAGTTTCATTACTTTTAGAGGAATCTGATCTTCGGAGATCCCCACGTGTAAAGACTACACCCTTGAGGCGACC
HAP-66D4  1     ----------------------------------------------------------------------------------------
ATRX ORF  2001  GACAGAAACTAACCCTGTAACATCTAATTCAGATGAAGAATGTAATGAAACAGTTAAGGAGAAACAAAAACTATCAGTTC
HAP-66D4  1     ----------------------------------------------------------------------------------------
ATRX ORF  2081  CAGTGAGAAAAAAGGATAAGCGTAATTCTTCTGACAGTGCTATAGATAATCCTAAGCCTAATAAATTGCCAAAATCTAAG
HAP-66D4  1     ----------------------------------------------------------------------------------------
ATRX ORF  2161  CAATCAGAGACTGTGGATCAAAATTCAGATTCTGATGAAATGCTAGCAATCCTCAAAGGGGTGAGCAGGATGAGTCACAG
HAP-66D4  1     ----------------------------------------------------------------------------------------
ATRX ORF  2241  TTCTTCTTCAGATACTGATATTAATGAAATTCATACAAACCATAAGACTTTGTATGATTTAAAGACTCAGGCGGGGAAAG
HAP-66D4  1     ----------------------------------------------------------------------------------------
ATRX ORF  2321  ATGATAAAGGAAAAAGGAAACGAAAAAGTTCTACATCTGGCTCAGATTTTGATACTAAAAAGGGCAAATCAGCTAAGAGC
HAP-66D4  1     ----------------------------------------------------------------------------------------
ATRX ORF  2401  TCTATAATTTCTAAAAAGAAACGACAAACCCAGTCTGAGTCTTCTAATTATGACTCAGAATTAGAAAAAGAGATAAAGAG
HAP-66D4  1     ----------------------------------------------------------------------------------------
ATRX ORF  2481  CATGAGTAAAATTGGTGCTGCCAGAACCACCAAAAAAAGAATTCCAAATACAAAAGATTTTGACTCTTCTGAAGATGAGA
HAP-66D4  1     ----------------------------------------------------------------------------------------
ATRX ORF  2561  AACACAGCAAAAAAGGAATGGATAATCAAGGGCACAAAAATTTGAAGACCTCACAAGAAGGATCATCTGATGATGCTGAA
HAP-66D4  1     ----------------------------------------------------------------------------------------
ATRX ORF  2641  AGAAAACAAGAGAGAGAGACTTTCTCTTCAGCAGAAGGCACAGTTGATAAAGACACGACCATCATGGAATTAAGAGATCG
HAP-66D4  1     ----------------------------------------------------------------------------------------
ATRX ORF  2721  ACTTCCTAAGAAGCAGCAAGCAAGTGCTTCCACTGATGGTGTCGATAAGCTTTCTGGGAAAGAGCAGAGTTTTACTTCTT
HAP-66D4  1     ----------------------------------------------------------------------------------------
ATRX ORF  2801  TGGAAGTTAGAAAAGTTGCTGAAACTAAAGAAAAGAGCAAGCATCTCAAAACCAAAACATGTAAAAAAGTACAGGATGGC
HAP-66D4  1     ----------------------------------------------------------------------------------------
ATRX ORF  2881  TTATCTGATATTGCAGAGAAATTCCTAAAGAAAGACCAGAGCGATGAAACTTCTGAAGATGATAAAAAGCAGAGCAAAAA
HAP-66D4  1     ----------------------------------------------------------------------------------------
ATRX ORF  2961  GGGAACTGAAGAAAAAAAGAAACCTTCAGACTTTAAGAAAAAAGTAATTAAAATGGAACAACAGTATGAATCTTCATCTG
HAP-66D4  1     ----------------------------------------------------------------------------------------
ATRX ORF  3041  ATGGCACTGAAAAGTTACCTGAGCGAGAAGAAATTTGTCATTTTCCTAAGGGCATAAAACAAATTAAGAATGGAACAACT
HAP-66D4  1     ----------------------------------------------------------------------------------------
ATRX ORF  3121  GATGGAGAAAAGAAAAGTAAAAAAATAAGAGATAAAACTTCTAAAAAGAAGGATGAATTATCTGATTATGCTGAGAAGTC
HAP-66D4  1     ----------------------------------------------------------------------------------------
ATRX ORF  3201  AACAGGGAAAGGAGATAGTTGTGACTCTTCAGAGGATAAAAAGAGTAAGAATGGAGCATATGGTAGAGAGAAGAAAAGGT
HAP-66D4  1     ----------------------------------------------------------------------------------------
ATRX ORF  3281  GCAAGTTGCTTGGAAAGAGTTCAAGGAAGAGACAAGATTGCTCATCATCTGATACTGAGAAATATTCCATGAAAGAAGAT
HAP-66D4  1     ----------------------------------------------------------------------------------------
ATRX ORF  3361  GGTTGTAACTCTTCTGATAAGAGACTGAAAAGAATAGAATTGAGGGAAAGAAGAAATTTAAGTTCAAAGAGAAATACTAA
HAP-66D4  1     ----------------------------------------------------------------------------------------
ATRX ORF  3441  GGAAATACAAAGTGGCTCATCATCATCTGATGCTGAGGAAAGTTCTGAAGATAATAAAAAGAAGAAGCAAAGAACTTCAT
HAP-66D4  1     ----------------------------------------------------------------------------------------
ATRX ORF  3521  CTAAAAAGAAGGCAGTCATTGTCAAGGAGAAAAAGAGAAACTCCCTAAGAACAAGCACTAAAAGGAAGCAAGCTGACATT
HAP-66D4  1     ----------------------------------------------------------------------------------------
ATRX ORF  3601  ACATCCTCATCTTCTTCTGATATAGAAGATGATGATCAGAATTCTATAGGTGAGGGAAGCAGCGATGAACAGAAAATTAA
HAP-66D4  1     ----------------------------------------------------------------------------------------
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ATRX ORF   3681 GCCTGTCACTGAAAATTTAGTGCTGTCTTCACATACTGGATTTTGCCAATCTTCAGGAGATGAAGCCTTATCTAAATCAG
HAP-66D4   1    ----------------------------------------------------------------------------

ATRX ORF   3761 TGCCTGTCACAGTGGATGATGATGATGACGACAATGATCCTGAGAATAGAATTGCCAAGAAGATGCTTTTAGAAGAAATT
HAP-66D4   1    ----------------------------------------------------------------------------

ATRX ORF   3841 AAAGCCAATCTTTCCTCTGATGAGGATGGATCTTCAGATGATGAGCCAGAAGAAGGGAAAAAAAGAACTGGAAAACAAAA
HAP-66D4   1    ----------------------------------------------------------------------------

ATRX ORF   3921 TGAAGAAAACCCAGGAGATGAGGAAGCAAAAAATCAAGTCAATTCTGAATCAGATTCAGATTCTGAAGAATCTAAGAAGC
HAP-66D4   1    ----------------------------------------------------------------------------

ATRX ORF   4001 CAAGATACAGACATAGGCTTTTGCGGCACAAATTGACTGTGAGTGACGGAGAATCTGGAGAAGAAAAAAAGACAAAGCCT
HAP-66D4   1    ----------------------------------------------------------------------------

ATRX ORF   4081 AAAGAGCATAAAGAAGTCAAAGGCAGAAACAGAAGAAAGGTGAGCAGTGAAGATTCAGAAGATTCTGATTTTCAGGAATC
HAP-66D4   1    ----------------------------------------------------------------------------

ATRX ORF   4161 AGGAGTTAGTGAAGAAGTTAGTGAATCCGAAGATGAACAGCGGCCCAGAACAAGGTCTGCAAAGAAAGCAGAGTTGGAAG
HAP-66D4   1    ----------------------------------------------------------------------------

ATRX ORF   4241 AAAATCAGCGGAGCTATAAACAGAAAAAGAAAAGGCGACGTATTAAGGTTCAAGAAGATTCATCCAGTGAAAACAAGAGT
HAP-66D4   1    ----------------------------------------------------------------------------

ATRX ORF   4321 AATTCTGAGGAAGAAGAGGAGGAAAAAGAAGAGGAGGAGGAAGAGGAGGAGGAGGAAGAGGAGGAGGAAGATGAAAA
HAP-66D4   1    ----------------------------------------------------------------------------

ATRX ORF   4401 TGATGATTCCAAGTCTCCTGGAAAAGGCAGAAAGAAAATTCGGAAGATTCTTAAAGATGATAAACTGAGAACAGAAACAC
HAP-66D4   1    ----------------------------------------------------------------------------

ATRX ORF   4481 AAAATGCTCTTAAGGAAGAGGAAGAGAGACGAAAACGTATTGCTGAGAGGGAGCGTGAGCGAGAAAAATTGAGAGAGGTG
HAP-66D4   1    ----------------------------------------------------------------------------

ATRX ORF   4561 ATAGAAATTGAAGATGCTTCACCCACCAAGTGTCCAATAACAACCAAGTTGGTTTTAGATGAAGATGAAGAAACCAAAGA
HAP-66D4   1    ----------------------------------------------------------------------------

ATRX ORF   4641 ACCTTTAGTGCAGGTTCATAGAAATATGGTTATCAAATTGAAACCCCATCAAGTAGATGGTGTTCAGTTTATGTGGGATT
HAP-66D4   1    ----------------------------------------------------------------------------

ATRX ORF   4721 GCTGCTGTGAGTCTGTGAAAAAAACAAAGAAATCTCCAGGTTCAGGATGCATTCTTGCCCACTGTATGGGCCTTGGTAAG
HAP-66D4   1    ----------------------------------------------------------------------------

ATRX ORF   4801 ACTTTACAGGTGGTAAGTTTTCTTCATACAGTTCTTTTGTGTGACAAACTGGATTTCAGCACGGCGTTAGTGGTTTGTCC
HAP-66D4   1    ----------------------------------------------------------------------------

ATRX ORF   4881 TCTTAATACTGCTTTGAATTGGATGAATGAATTTGAGAAGTGGCAAGAGGGATTAAAAGATGATGAGAAGCTTGAGGTTT
HAP-66D4   1    ----------------------------------------------------------------------------

ATRX ORF   4961 CTGAATTAGCAACTGTGAAACGTCCTCAGGAGAGAAGCTACATGCTGCAGAGGTGGCAAGAAGATGGTGGTGTTATGATC
HAP-66D4   1    ----------------------------------------------------------------------------

ATRX ORF   5041 ATAGGCTATGAGATGTATAGAAATCTTGCTCAAGGAAGGAATGTGAAGAGTCGGAAACTTAAAGAAATATTTAACAAAGC
HAP-66D4   1    ----------------------------------------------------------------------------

ATRX ORF   5121 TTTGGTTGATCCAGGCCCTGATTTTGTTGTTTGTGATGAAGGCCATATTCTAAAAAATGAAGCATCTGCTGTTTCTAAAG
HAP-66D4   1    ----------------------------------------------------------------------------

ATRX ORF   5201 CTATGAATTCTATACGATCAAGGAGGAGGATTATTTTAACAGGAACACCACTTCAAAATAACCTAATTGAGTATCATTGT
HAP-66D4   1    ----------------------------------------------------------------------------

ATRX ORF   5281 ATGGTTAATTTTATCAAGGAAAATTTACTTGGATCCATTAAGGAGTTCAGGAATAGATTTATAAATCCAATTCAAAATGG
HAP-66D4   1    ----------------------------------ATTAAGGAGTTCAGGAATAGATTTATAAATCCAATTCAAAATGG

ATRX ORF   5361 TCAGTGTGCAGATTCTACCATGGTAGATGTCAGAGTGATGAAAAAACGTGCTCACATTCTCTATGAGATGTTAGCTGGAT
HAP-66D4   45   TCAGTGTGCAGATTCTACCATGGTAGATGTCAGAGTGATGAAAAAACGTGCTCACATTCTCTATGAGATGTTAGCTGGAT

ATRX ORF   5441 GTGTTCAGAGGAAAGATTATACAGCATTAACAAAATTCTTGCCTCCAAAACACGAATATGTGTTAGCTGTGAGAATGACT
HAP-66D4   125  GTGTTCAGAGGAAAGATTATACAGCATTAACAAAATTCTTGCCTCCAAAACACGAATATGTGTTAGCTGTGAGAATGACT

ATRX ORF   5521 TCTATTCAGTGCAAGCTCTATCAGTACTACTTAGATCACTTAACAGGTGTGGGCAATAATAGTGAAGGTGGAAGAGGAAA
HAP-66D4   205  TCTATTCAGTGCAAGCTCTATCAGTACTACTTAGATCACTTAACAGGTGTGGGCAATAATAGTGAAGGTGGAAGAGGAAA
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ATRX ORF   5601 GGCAGGTGCAAAGCTTTTCCAAGATTTTCAGATGTTAAGTAGAATATGGACTCATCCTTGGTGTTTGCAGCTAGACTACA
HAP-66D4   285  GGCAGGTGCA----------------------------------------------------------------------

ATRX ORF   5681 TTAGCAAAGAAAATAAGGGTTATTTTGATGAAGACAGTATGGATGAATTTATAGCCTCAGATTCTGATGAAACCTCCATG
HAP-66D4   294  ----------------------------------------------------------------------------

ATRX ORF   5761 AGTTTAAGCTCCGATGATTATACAAAAAAGAAGAAAAAAGGGAAAAAGGGGAAAAAAGATAGTAGCTCAAGTGGAAGTGG
HAP-66D4   294  ----------------------------------------------------------------------------

ATRX ORF   5841 CAGTGACAATGATGTTGAAGTGATTAAGGTCTGGAATTCAAGATCTCGGGGAGGTGGTGAAGGAAATGTGGATGAAACAG
HAP-66D4   294  ----------------------------------------------------------------------------

ATRX ORF   5921 GAAACAATCCTTCTGTTTCTTTAAAACTGGAAGAAAGTAAAGCTACTTCTTCTTCTAATCCAAGCAGCCCAGCTCCAGAC
HAP-66D4   294  ----------------------------------------------------------------------------

ATRX ORF   6001 TGGTACAAAGATTTTGTTACAGATGCTGATGCTGAGGTTTTAGAGCATTCTGGGAAAATGGTACTTCTCTTTGAAATTCT
HAP-66D4   294  ----------------------------------------------------------------------------

ATRX ORF   6081 TCGAATGGCAGAGGAAATTGGGGATAAAGTCCTTGTTTTCAGCCAGTCCCTCATATCTCTGGACTTGATTGAAGATTTTC
HAP-66D4   294  ----------------------------------------------------------------------------

ATRX ORF   6161 TTGAATTAGCTAGTAGGGAGAAGACAGAAGATAAAGATAAACCCCTTATTTATAAAGGTGAGGGGAAGTGGCTTCGAAAC
HAP-66D4   294  ----------------------------------------------------------------------------

ATRX ORF   6241 ATTGACTATTACCGTTTAGATGGTTCCACTACTGCACAGTCAAGGAAGAAGTGGGCTGAAGAATTTAATGATGAAACTAA
HAP-66D4   294  ----------------------------------------------------------------------------

ATRX ORF   6321 TGTGAGAGGACGATTATTTATCATTTCTACTAAAGCAGGATCTCTAGGAATTAATCTGGTAGCTGCTAATCGAGTAATTA
HAP-66D4   294  ----------------------------------------------------------------------------

ATRX ORF   6401 TATTCGACGCTTCTTGGAATCCATCTTATGACATCCAGAGTATATTCAGAGTTTATCGCTTTGGACAAACTAAGCCTGTT
HAP-66D4   294  ----------------------------------------------------------------------------

ATRX ORF   6481 TATGTATATAGGTTCTTAGCTCAGGGAACCATGGAAGATAAGATTTATGATCGGCAAGTAACTAAGCAGTCACTGTCTTT
HAP-66D4   294  ----------------------------------------------------------------------------

ATRX ORF   6561 TCGAGTTGTTGATCAGCAGCAGGTGGAGCGTCATTTTACTATGAATGAGCTTACTGAACTTTATACTTTTGAGCCAGACT
HAP-66D4   294  ----------------------------------------------------------------------------

ATRX ORF   6641 TATTAGATGACCCTAATTCAGAAAAGAAGAAGAAGAGGGATACTCCCATGCTGCCAAAGGATACCATACTTGCAGAGCTC
HAP-66D4   294  ----------------------------------------------------------------------------

ATRX ORF   6721 CTTCAGATACATAAAGAACACATTGTAGGATACCATGAACATGATTCTCTTTTGGACCACAAAGAAGAAGAAGAGTTGAC
HAP-66D4   294  ----------------------------------------------------------------------------

ATRX ORF   6801 TGAAGAAGAAAGAAAAGCAGCTTGGGCTGAGTATGAAGCAGAGAAGAAGGTACTGACCATGCGTTTCAACATACCAACTG
HAP-66D4   294  ----------------------------------------------------------------------------

ATRX ORF   6881 GGACCAATTTACCCCCTGTCAGTTTCAACTCTCAAACTCCTTATATTCCTTTCAATTTGGGAGCCCTGTCAGCAATGAGT
HAP-66D4   294  ----------------------------------------------------------------------------

ATRX ORF   6961 AATCAACAGCTGGAGGACCTCATTAATCAAGGAAGAGAAAAAGTTGTAGAAGCAACAAACAGTGTGACAGCAGTGAGGAT
HAP-66D4   294  ----------------------------------------------------------------------------

ATRX ORF   7041 TCAACCTCTTGAGGATATAATTTCAGCTGTATGGAAGGAGAACATGAATCTCTCAGAGGCCCAAGTACAGGCGTTAGCAT
HAP-66D4   294  ----------------------------------------------------------------------------

ATRX ORF   7121 TAAGTAGACAAGCCAGCCAGGAGCTTGATGTTAAACGAAGAGAAGCAATCTACAATGATGTATTGACAAAACAACAGATG
HAP-66D4   294  ----------------------------------------------------------------------------

ATRX ORF   7201 TTAATCAGCTGTGTTCAGCGAATACTTATGAACAGAAGGCTCCAGCAGCAGTACAATCAGCAGCAACAGCAACAAATGAC
HAP-66D4   294  ----------------------------------------------------------------------------

ATRX ORF   7281 TTATCAACAAGCAACACTGGGTCACCTCATGATGCCAAAGCCCCCAAATTTGATCATGAATCCTTCTAACTACCAGCAGA
HAP-66D4   294  ----------------------------------------------------------------------------

ATRX ORF   7361 TTGATATGAGAGGAATGTATCAGCCAGTGGCTGGTGGTATGCAGCCACCACCATTACAGCGTGCACCACCCCCAATGAGA
HAP-66D4   294  ----------------------------------------------------------------------------

ATRX ORF   7441 AGCAAAAATCCAGGACCTTCCCAAGGGAAATCAATGTGA
HAP-66D4   294  ---------------------------------------
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b) AS fragm nt No. 2 (TXA-1B3)

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ATRX ORF  1     ATGACCGCTGAGCCCATGAGTGAAAGCAAGTTGAATACATTGGTGCAGAAGCTTCATGACTTCCTTGCACACTCATCAGA
TXA-1B3   1     ------------------------------------------------------------------------------

ATRX ORF  81    AGAATCTGAAGAAACAAGTTCTCCTCCACGACTTGCAATGAATCAAAACACAGATAAAATCAGTGGTTCTGGAAGTAACT
TXA-1B3   1     ------------------------------------------------------------------------------

ATRX ORF  161   CTGATATGATGGAAAACAGCAAGGAAGAGGGAACTAGCTCTTCAGAAAAATCCAAGTCTTCAGGATCGTCACGATCAAAG
TXA-1B3   1     ------------------------------------------------------------------------------

ATRX ORF  241   AGGAAACCTTCAATTGTAACAAAGTATGTAGAATCAGATGATGAAAAACCTTTGGATGATGAAACTGTAAATGAAGATGC
TXA-1B3   1     ------------------------------------------------------------------------------

ATRX ORF  321   GTCTAATGAAAATTCAGAAAATGATATTACTATGCAGAGCTTGCCAAAAGGTACAGTGATTGTACAGCCAGAGCCAGTGC
TXA-1B3   1     ------------------------------------------------------------------------------

ATRX ORF  401   TGAATGAAGACAAAGATGATTTTAAAGGGCCTGAATTTAGAAGCAGAAGTAAAATGAAAACTGAAAATCTCAAAAAACGC
TXA-1B3   1     ------------------------------------------------------------------------------

ATRX ORF  481   GGAGAAGATGGGCTTCATGGGATTGTGAGCTGCACTGCTTGTGGACAACAGGTCAATCATTTTCAAAAAGATTCCATTTA
TXA-1B3   1     ------------------------------------------------------------------------------

ATRX ORF  561   TAGACACCCTTCATTGCAAGTTCTTATTTGTAAGAATTGCTTTAAGTATTACATGAGTGATGATATTAGCCGTGACTCAG
TXA-1B3   1     ------------------------------------------------------------------------------

ATRX ORF  641   ATGGAATGGATGAACAATGTAGGTGGTGTGCGGAAGGTGGAAACTTGATTTGTTGTGACTTTTGCCATAATGCTTTCTGC
TXA-1B3   1     ------------------------------------------------------------------------------

ATRX ORF  721   AAGAAATGCATTCTACGCAACCTTGGTCGAAAGGAGTTGTCCACAATAATGGATGAAAACAACCAATGGTATTGCTACAT
TXA-1B3   1     ------------------------------------------------------------------------------

ATRX ORF  801   TTGTCACCCAGAGCCTTTGTTGGACTTGGTCACTGCATGTAACAGCGTATTTGAGAATTTAGAACAGTTGTTGCAGCAAA
TXA-1B3   1     ------------------------------------------------------------------------------

ATRX ORF  881   ATAAGAAGAAGATAAAAGTTGACAGTGAAAAGAGTAATAAAGTATATGAACATACATCCAGATTTTCTCCAAAGAAGACT
TXA-1B3   1     ------------------------------------------------------------------------------

ATRX ORF  961   AGTTCAAATTGTAATGGAGAAGAAAAGAAATTAGATGATTCCTGTTCTGGCTCTGTAACCTACTCTTATTCCGCACTAAT
TXA-1B3   1     ------------------------------------------------------------------------------

ATRX ORF  1041  TGTGCCCAAAGAGATGATTAAGAAGGCAAAAAAACTGATTGAGACCACAGCCAACATGAACTCCAGTTATGTTAAATTTT
TXA-1B3   1     ------------------------------------------------------------------------------

ATRX ORF  1121  TAAAGCAGGCAACAGATAATTCAGAAATCAGTTCTGCTACAAAATTACGTCAGCTTAAGGCTTTTAAGTCTGTGTTGGCT
TXA-1B3   1     ------------------------------------------------------------------------------

ATRX ORF  1201  GATATTAAGAAGGCTCATCTTGCATTGGAAGAAGACTTAAATTCCGAGTTTCGAGCGATGGATGCTGTAAACAAAGAGAA
TXA-1B3   1     ------------------------------------------------------------------------------

ATRX ORF  1281  AAATACCAAAGAGCATAAAGTCATAGATGCTAAGTTTGAAACAAAAGCACGAAAAGGAGAAAAACCTTGTGCTTTGGAAA
TXA-1B3   1     ------------------------------------------------------------------------------

ATRX ORF  1361  AGAAGGATATTTCAAAGTCAGAAGCTAAACTTTCAAGAAAACAGGTAGATAGTGAGCACATGCATCAGAATGTTCCAACA
TXA-1B3   1     ------------------------------------------------------------------------------

ATRX ORF  1441  GAGGAACAAAGAACAAATAAAAGYACCGGTGGTGAACATAAGAAATCTGATAGAAAAGAAGAACCTCAATATGAACCTGC
TXA-1B3   1     ------------------------------------------------------------------------------

ATRX ORF  1521  CAACACTTCTGAAGATTTAGACATGGATATTGTGTCTGTTCCTTCCTCAGTTCCAGAAGACATTTTTGAGAATCTTGAGA
TXA-1B3   1     ------------------------------------------------------------------------------

ATRX ORF  1601  CTGCTATGGAAGTTCAGAGTTCAGTTGATCATCAAGGGGATGGCAGCAGTGGAACTGAACAAGAAGTGGAGAGTTCATCT
TXA-1B3   1     ------------------------------------------------------------------------------

ATRX ORF  1681  GTAAAATTAAATATTTCTTCAAAAGACAACAGAGGAGGTATTAAATCAAAAACTACAGCTAAAGTAACAAAAGAATTATA
TXA-1B3   1     ------------------------------------------------------------------------------

ATRX ORF  1761  TGTTAAACTCACTCCTGTTTCCCTTCCTAATTCCCCAATTAAAGGTGCTGATTGTCAGGAAGTTCCACAAGATAAAGATG
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TXA-1B3   1     ------------------------------------------------------------------------------------------

ATRX ORF  1841  GCTATAAAAGTTGTGGTCTGAACCCCAAGTTAGAGAAATGTGGACTTGGACAGGAAAACAGTGATAATGAGCATTTGGTT
TXA-1B3   1     ------------------------------------------------------------------------------------------

ATRX ORF  1921  GAAAATGAAGTTTCATTACTTTTAGAGGAATCTGATCTTCGGAGATCCCCACGTGTAAAGACTACACCCTTGAGGCGACC
TXA-1B3   1     ------------------------------------------------------------------------------------------

ATRX ORF  2001  GACAGAAACTAACCCTGTAACATCTAATTCAGATGAAGAATGTAATGAAACAGTTAAGGAGAAACAAAAACTATCAGTTC
TXA-1B3   1     ------------------------------------------------------------------------------------------

ATRX ORF  2081  CAGTGAGAAAAAAGGATAAGCGTAATTCTTCTGACAGTGCTATAGATAATCCTAAGCCTAATAAATTGCCAAAATCTAAG
TXA-1B3   1     ------------------------------------------------------------------------------------------

ATRX ORF  2161  CAATCAGAGACTGTGGATCAAAATTCAGATTCTGATGAAATGCTAGCAATCCTCAAAGGGGTGAGCAGGATGAGTCACAG
TXA-1B3   1     ------------------------------------------------------------------------------------------

ATRX ORF  2241  TTCTTCTTCAGATACTGATATTAATGAAATTCATACAAACCATAAGACTTTGTATGATTTAAAGACTCAGGCGGGGAAAG
TXA-1B3   1     ------------------------------------------------------------------------------------------

ATRX ORF  2321  ATGATAAAGGAAAAAGGAAACGAAAAAGTTCTACATCTGGCTCAGATTTTGATACTAAAAAGGGCAAATCAGCTAAGAGC
TXA-1B3   1     ------------------------------------------------------------------------------------------

ATRX ORF  2401  TCTATAATTTCTAAAAAGAAACGACAAACCCAGTCTGAGTCTTCTAATTATGACTCAGAATTAGAAAAAGAGATAAAGAG
TXA-1B3   1     ------------------------------------------------------------------------------------------

ATRX ORF  2481  CATGAGTAAAATTGGTGCTGCCAGAACCACCAAAAAAAGAATTCCAAATACAAAAGATTTTGACTCTTCTGAAGATGAGA
TXA-1B3   1     ------------------------------------------------------------------------------------------

ATRX ORF  2561  AACACAGCAAAAAAGGAATGGATAATCAAGGGCACAAAAATTTGAAGACCTCACAAGAAGGATCATCTGATGATGCTGAA
TXA-1B3   1     ------------------------------------------------------------------------------------------

ATRX ORF  2641  AGAAAACAAGAGAGAGAGACTTTCTCTTCAGCAGAAGGCACAGTTGATAAAGACACGACCATCATGGAATTAAGAGATCG
TXA-1B3   1     ------------------------------------------------------------------------------------------

ATRX ORF  2721  ACTTCCTAAGAAGCAGCAAGCAAGTGCTTCCACTGATGGTGTCGATAAGCTTTCTGGGAAAGAGCAGAGTTTTACTTCTT
TXA-1B3   1     ------------------------------------------------------------------------------------------

ATRX ORF  2801  TGGAAGTTAGAAAAGTTGCTGAAACTAAAGAAAAGAGCAAGCATCTCAAAACCAAAACATGTAAAAAAGTACAGGATGGC
TXA-1B3   1     ------------------------------------------------------------------------------------------

ATRX ORF  2881  TTATCTGATATTGCAGAGAAATTCCTAAAGAAAGACCAGAGCGATGAAACTTCTGAAGATGATAAAAAGCAGAGCAAAAA
TXA-1B3   1     ------------------------------------------------------------------------------------------

ATRX ORF  2961  GGGAACTGAAGAAAAAAAGAAACCTTCAGACTTTAAGAAAAAAGTAATTAAAATGGAACAACAGTATGAATCTTCATCTG
TXA-1B3   1     ------------------------------------------------------------------------------------------

ATRX ORF  3041  ATGGCACTGAAAAGTTACCTGAGCGAGAAGAAATTTGTCATTTTCCTAAGGGCATAAAACAAATTAAGAATGGAACAACT
TXA-1B3   1     ------------------------------------------------------------------------------------------

ATRX ORF  3121  GATGGAGAAAAGAAAAGTAAAAAAATAAGAGATAAAACTTCTAAAAAGAAGGATGAATTATCTGATTATGCTGAGAAGTC
TXA-1B3   1     ------------------------------------------------------------------------------------------

ATRX ORF  3201  AACAGGGAAAGGAGATAGTTGTGACTCTTCAGAGGATAAAAAGAGTAAGAATGGAGCATATGGTAGAGAGAAGAAAAGGT
TXA-1B3   1     ------------------------------------------------------------------------------------------

ATRX ORF  3281  GCAAGTTGCTTGGAAAGAGTTCAAGGAAGAGACAAGATTGCTCATCATCTGATACTGAGAAATATTCCATGAAAGAAGAT
TXA-1B3   1     ------------------------------------------------------------------------------------------

ATRX ORF  3361  GGTTGTAACTCTTCTGATAAGAGACTGAAAAGAATAGAATTGAGGGAAAGAAGAAATTTAAGTTCAAAGAGAAATACTAA
TXA-1B3   1     ------------------------------------------------------------------------------------------

ATRX ORF  3441  GGAAATACAAAGTGGCTCATCATCATCTGATGCTGAGGAAAGTTCTGAAGATAATAAAAAGAAGAAGCAAAGAACTTCAT
TXA-1B3   1     ------------------------------------------------------------------------------------------

ATRX ORF  3521  CTAAAAAGAAGGCAGTCATTGTCAAGGAGAAAAAGAGAAACTCCCTAAGAACAAGCACTAAAAGGAAGCAAGCTGACATT
TXA-1B3   1     ------------------------------------------------------------------------------------------

ATRX ORF  3601  ACATCCTCATCTTCTTCTGATATAGAAGATGATGATCAGAATTCTATAGGTGAGGGAAGCAGCGATGAACAGAAAATTAA
TXA-1B3   1     ------------------------------------------------------------------------------------------

ATRX ORF  3681  GCCTGTCACTGAAAATTTAGTGCTGTCTTCACATACTGGATTTTGCCAATCTTCAGGAGATGAAGCCTTATCTAAATCAG
TXA-1B3   1     ------------------------------------------------------------------------------------------
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ATRX ORF   3761 TGCCTGTCACAGTGGATGATGATGATGACGACAATGATCCTGAGAATAGAATTGCCAAGAAGATGCTTTTAGAAGAAATT
TXA-1B3    1    ------------------------------------------------------------------------------

ATRX ORF   3841 AAAGCCAATCTTTCCTCTGATGAGGATGGATCTTCAGATGATGAGCCAGAAGAAGGGAAAAAAAGAACTGGAAAACAAAA
TXA-1B3    1    ------------------------------------------------------------------------------

ATRX ORF   3921 TGAAGAAAACCCAGGAGATGAGGAAGCAAAAAATCAAGTCAATTCTGAATCAGATTCAGATTCTGAAGAATCTAAGAAGC
TXA-1B3    1    ------------------------------------------------------------------------------

ATRX ORF   4001 CAAGATACAGACATAGGCTTTTGCGGCACAAATTGACTGTGAGTGACGGAGAATCTGGAGAAGAAAAAAAGACAAAGCCT
TXA-1B3    1    ------------------------------------------------------------------------------

ATRX ORF   4081 AAAGAGCATAAAGAAGTCAAAGGCAGAAACAGAAGAAAGGTGAGCAGTGAAGATTCAGAAGATTCTGATTTTCAGGAATC
TXA-1B3    1    ------------------------------------------------------------------------------

ATRX ORF   4161 AGGAGTTAGTGAAGAAGTTAGTGAATCCGAAGATGAACAGCGGCCCAGAACAAGGTCTGCAAAGAAAGCAGAGTTGGAAG
TXA-1B3    1    ------------------------------------------------------------------------------

ATRX ORF   4241 AAAATCAGCGGAGCTATAAACAGAAAAAGAAAAGGCGACGTATTAAGGTTCAAGAAGATTCATCCAGTGAAAACAAGAGT
TXA-1B3    1    ------------------------------------------------------------------------------

ATRX ORF   4321 AATTCTGAGGAAGAAGAGGAGGAAAAAGAAGAGGAGGAGGAAGAGGAGGAGGAGGAAGAGGAGGAGGAAGATGAAAA
TXA-1B3    1    ------------------------------------------------------------------------------

ATRX ORF   4401 TGATGATTCCAAGTCTCCTGGAAAAGGCAGAAAGAAAATTCGGAAGATTCTTAAAGATGATAAACTGAGAACAGAAACAC
TXA-1B3    1    ------------------------------------------------------------------------------

ATRX ORF   4481 AAAATGCTCTTAAGGAAGAGGAAGAGAGACGAAAACGTATTGCTGAGAGGGAGCGTGAGCGAGAAAAATTGAGAGAGGTG
TXA-1B3    1    ------------------------------------------------------------------------------

ATRX ORF   4561 ATAGAAATTGAAGATGCTTCACCCACCAAGTGTCCAATAACAACCAAGTTGGTTTTAGATGAAGATGAAGAAACCAAAGA
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ATRX ORF   4641 ACCTTTAGTGCAGGTTCATAGAAATATGGTTATCAAATTGAAACCCCATCAAGTAGATGGTGTTCAGTTTATGTGGGATT
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ATRX ORF   4721 GCTGCTGTGAGTCTGTGAAAAAAACAAAGAAATCTCCAGGTTCAGGATGCATTCTTGCCCACTGTATGGGCCTTGGTAAG
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ATRX ORF   4801 ACTTTACAGGTGGTAAGTTTTCTTCATACAGTTCTTTTGTGTGACAAACTGGATTTCAGCACGGCGTTAGTGGTTTGTCC
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ATRX ORF   4881 TCTTAATACTGCTTTGAATTGGATGAATGAATTTGAGAAGTGGCAAGAGGGATTAAAAGATGATGAGAAGCTTGAGGTTT
TXA-1B3    1    ------------------------------------------------------------------------------

ATRX ORF   4961 CTGAATTAGCAACTGTGAAACGTCCTCAGGAGAGAAGCTACATGCTGCAGAGGTGGCAAGAAGATGGTGGTGTTATGATC
TXA-1B3    1    ------------------------------------------------------------------------------

ATRX ORF   5041 ATAGGCTATGAGATGTATAGAAATCTTGCTCAAGGAAGGAATGTGAAGAGTCGGAAACTTAAAGAAATATTTAACAAAGC
TXA-1B3    1    ------------------------------------------------------------------------------

ATRX ORF   5121 TTTGGTTGATCCAGGCCCTGATTTTGTTGTTTGTGATGAAGGCCATATTCTAAAAAATGAAGCATCTGCTGTTTCTAAAG
TXA-1B3    1    ------------------------------------------------------------------------------

ATRX ORF   5201 CTATGAATTCTATACGATCAAGGAGGAGGATTATTTTAACAGGAACACCACTTCAAAATAACCTAATTGAGTATCATTGT
TXA-1B3    1    ------------------------------------------------------------------------------

ATRX ORF   5281 ATGGTTAATTTTATCAAGGAAAATTTACTTGGATCCATTAAGGAGTTCAGGAATAGATTTATAAATCCAATTCAAAATGG
TXA-1B3    1    ------------------------------------------------------------------------------

ATRX ORF   5361 TCAGTGTGCAGATTCTACCATGGTAGATGTCAGAGTGATGAAAAAACGTGCTCACATTCTCTATGAGATGTTAGCTGGAT
TXA-1B3    1    ------------------------------------------------------------------------------

ATRX ORF   5441 GTGTTCAGAGGAAAGATTATACAGCATTAACAAAATTCTTGCCTCCAAAACACGAATATGTGTTAGCTGTGAGAATGACT
TXA-1B3    1    ------------------------------------------------------------------------------

ATRX ORF   5521 TCTATTCAGTGCAAGCTCTATCAGTACTACTTAGATCACTTAACAGGTGTGGGCAATAATAGTGAAGGTGGAAGAGGAAA
TXA-1B3    1    ------------------------------------------------------------------------------

ATRX ORF   5601 GGCAGGTGCAAAGCTTTTCCAAGATTTTCAGATGTTAAGTAGAATATGGACTCATCCTTGGTGTTTGCAGCTAGACTACA
TXA-1B3    1    ------------------------------------------------------------------------------
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ATRX ORF   5681 TTAGCAAAGAAAATAAGGGTTATTTTGATGAAGACAGTATGGATGAATTTATAGCCTCAGATTCTGATGAAACCTCCATG
TXA-1B3    1    ------------------------------------------------------------------------------

ATRX ORF   5761 AGTTTAAGCTCCGATGATTATACAAAAAAGAAGAAAAAAGGGAAAAAGGGGAAAAAAGATAGTAGCTCAAGTGGAAGTGG
TXA-1B3    1    ------------------------------------------------------------------------------

ATRX ORF   5841 CAGTGACAATGATGTTGAAGTGATTAAGGTCTGGAATTCAAGATCTCGGGGAGGTGGTGAAGGAAATGTGGATGAAACAG
TXA-1B3    1    ------------------------------------------------------------------------------

ATRX ORF   5921 GAAACAATCCTTCTGTTTCTTTAAAACTGGAAGAAAGTAAAGCTACTTCTTCTTCTAATCCAAGCAGCCCAGCTCCAGAC
TXA-1B3    1    ------------------------------------------------------------------------------

ATRX ORF   6001 TGGTACAAAGATTTTGTTACAGATGCTGATGCTGAGGTTTTAGAGCATTCTGGGAAAATGGTACTTCTCTTTGAAATTCT
TXA-1B3    1    ------------------------------------------------------------------------------

ATRX ORF   6081 TCGAATGGCAGAGGAAATTGGGGATAAAGTCCTTGTTTTCAGCCAGTCCCTCATATCTCTGGACTTGATTGAAGATTTTC
TXA-1B3    1    ------------------------------------------------------------------------------

ATRX ORF   6161 TTGAATTAGCTAGTAGGGAGAAGACAGAAGATAAAGATAAACCCCTTATTTATAAAGGTGAGGGGAAGTGGCTTCGAAAC
TXA-1B3    1    ------------------------------------------------------------------------------

ATRX ORF   6241 ATTGACTATTACCGTTTAGATGGTTCCACTACTGCACAGTCAAGGAAGAAGTGGGCTGAAGAATTTAATGATGAAACTAA
TXA-1B3    1    ------------------------------------------------------------------------------

ATRX ORF   6321 TGTGAGAGGACGATTATTTATCATTTCTACTAAAGCAGGATCTCTAGGAATTAATCTGGTAGCTGCTAATCGAGTAATTA
TXA-1B3    1    ------------------------------------------------------------------------------

ATRX ORF   6401 TATTCGACGCTTCTTGGAATCCATCTTATGACATCCAGAGTATATTCAGAGTTTATCGCTTTGGACAAACTAAGCCTGTT
TXA-1B3    1    ------------------------------------------------------------------------------

ATRX ORF   6481 TATGTATATAGGTTCTTAGCTCAGGGAACCATGGAAGATAAGATTTATGATCGGCAAGTAACTAAGCAGTCACTGTCTTT
TXA-1B3    1    ------------------------------------------------------------------------------

ATRX ORF   6561 TCGAGTTGTTGATCAGCAGCAGGTGGAGCGTCATTTTACTATGAATGAGCTTACTGAACTTTATACTTTTGAGCCAGACT
TXA-1B3    1    ------------------------------------------------------------------------------

ATRX ORF   6641 TATTAGATGACCCTAATTCAGAAAAGAAGAAGAAGAGGGATACTCCCATGCTGCCAAAGGATACCATACTTGCAGAGCTC
TXA-1B3    1    ------------------------------------------------------------------------------

ATRX ORF   6721 CTTCAGATACATAAAGAACACATTGTAGGATACCATGAACATGATTCTCTTTTGGACCACAAAGAAGAAGAAGAGTTGAC
TXA-1B3    1    ------------------------------------------------------------------------------

ATRX ORF   6801 TGAAGAAGAAAGAAAAGCAGCTTGGGCTGAGTATGAAGCAGAGAAGAAGGTACTGACCATGCGTTTCAACATACCAACTG
TXA-1B3    1    ------------------------------------------------------------------------------

ATRX ORF   6881 GGACCAATTTACCCCCTGTCAGTTTCAACTCTCAAACTCCTTATATTCCTTTCAATTTGGGAGCCCTGTCAGCAATGAGT
TXA-1B3    1    ------------------------------------------------------------------------------

ATRX ORF   6961 AATCAACAGCTGGAGGACCTCATTAATCAAGGAAGAGAAAAAGTTGTAGAAGCAACAAACAGTGTGACAGCAGTGAGGAT
TXA-1B3    1    ------------------------------------------------------------------------------

ATRX ORF   7041 TCAACCTCTTGAGGATATAATTTCAGCTGTATGGAAGGAGAACATGAATCTCTCAGAGGCCCAAGTACAGGCGTTAGCAT
TXA-1B3    1    ------------------------------------------------------------------------------

ATRX ORF   7121 TAAGTAGACAAGCCAGCCAGGAGCTTGATGTTAAACGAAGAGAAGCAATCTACAATGATGTATTGACAAAACAACAGATG
TXA-1B3    1    ----------------------------------------------------------------------------AGATG

ATRX ORF   7201 TTAATCAGCTGTGTTCAGCGAATACTTATGAACAGAAGGCTCCAGCAGCAGTACAATCAGCAGCAACAGCAACAAATGAC
TXA-1B3    6    TTAATCAGCTGTGTTCAGCGAATACTTATGAACAGAAGGCTCCAGCAGCAGTACAATCAGCAGCAACAGCAACAAATGAC

ATRX ORF   7281 TTATCAACAAGCAACACTGGGTCACCTCATGATGCCAAAGCCCCCAAATTTGATCATGAATCCTTCTAACTACCAGCAGA
TXA-1B3    86   TTATCAACAAGCAACACTGGGTCACCTCATGATGCCAAAGCCCCCAAATTTGATCATGAATCCTTCTAACTACCAGCAGA

ATRX ORF   7361 TTGATATGAGAGGAATGTATCAGCCAGTGGCTGGTGGTATGCAGCCACCACCATTACAGCGTGCACCACCCCCAATGAGA
TXA-1B3    166  TTGATATGAGAGGAATGTATCAGCCAGTGGCTGGTGGTATGCAGCCACCACCATTACAGCGTGCACCACCCCCAATGAGA

ATRX ORF   7441 AGCAAAAATCCAGGACCTTCCCAAGGGAAATCAATGTGA----------
TXA-1B3    246  AGCAAAAATCCAGGACCTTCCCAAGGGAAATCAATGTATTTGCACTAAAGC
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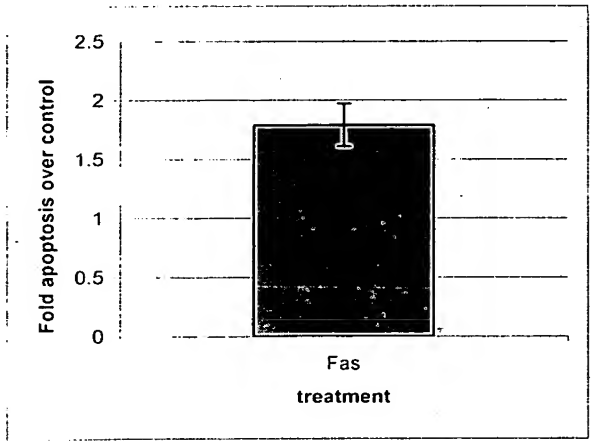
Figure 4:
Validation of the anti-apoptotic effect of ATRX

a) AS fragment No. 1 (HAP-66D4) LOF results



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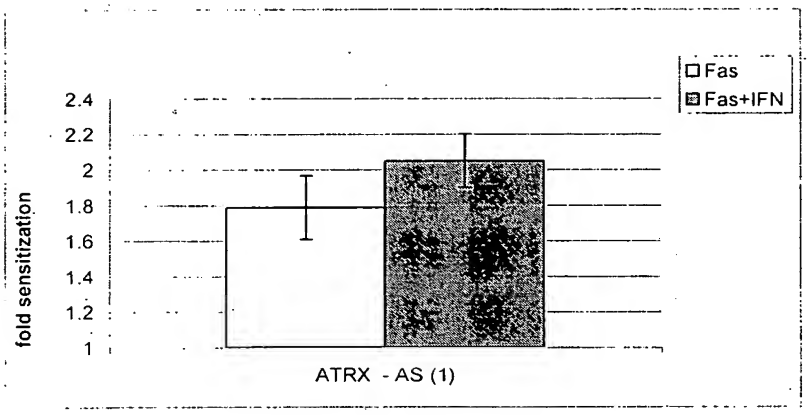
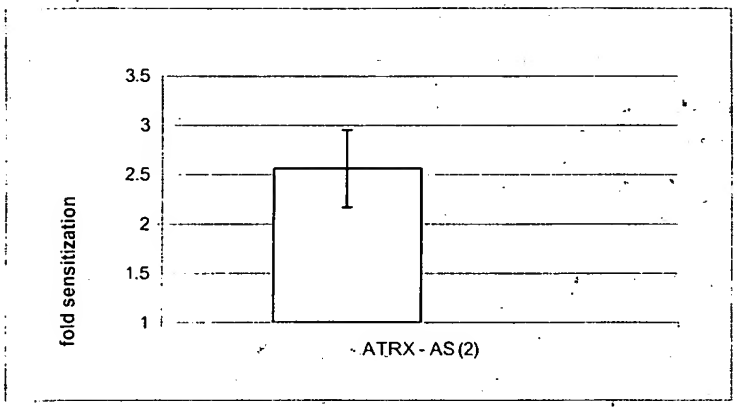
c) AS fragment No. 2 (TXA_1B3) LOF results